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(54) A carrier for a pump type atomiser

(57) A carrier has a housing (141) within which is mounted a bottle holder (142). An atomiser (1) is housed within the bottle holder (142) with a nozzle (10) resting against a stop (143) at a top of the bottle holder (142). A bottle raising cam (145) is pivotally mounted on a base of the bottle holder (142). Downwardly depending flanges at a bottom of the bottle holder (142) slidably receive an operating button (150) for actuation of the cam (145). Upon depressing the button (150) the cam (145) pivots to raise the atomiser (1) thus operating the nozzle (10) to discharge a fine atomised spray from the atomiser.

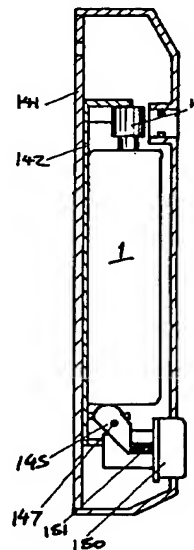


FIG 2D

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Description

This invention relates to a carrier for a pump type atomiser.

According to the invention there is provided a carrier for a pump type atomiser of the type comprising a container with a pump for dispensing a liquid from the container through a discharge nozzle at a top of the container, the carrier comprising means for reception of the atomiser and means for mounting the carrier on a support surface, and means for actuating the pump to discharge liquid from the atomiser.

In one embodiment of the invention the carrier comprises a support having means for mounting the container in an upright position and the actuating means is operable to engage and lift the container on the support to engage the nozzle with an associated stop on the support for operation of the pump.

In a preferred embodiment the actuating means is a cam.

In a particularly preferred embodiment the carrier comprises a housing within which is mounted a holder for reception of the atomiser with the nozzle of the atomiser resting against a stop at a top of the holder, a container raising cam pivotally mounted on a base of the holder, downwardly depending flanges at a bottom of the holder slidably receiving an operating button for actuation of the cam.

In a further embodiment the carrier comprises a housing, a support within the housing for the atomiser, the support having a frame for reception of the atomiser, the frame being supported on a pivot link having inclined pivot arms at each side of the frame, lower ends of each pivot arm being pivotally mounted on the housing, an operating button engaging the frame through the link arms, the operating button slidably movable in a guide for movement of the frame upwardly to engage the nozzle of an atomiser mounted in the frame against a stop to operate the pump of the atomiser.

In another embodiment the carrier has means to demountably secure the atomiser thereon.

In another embodiment the carrier has a housing for reception of the atomiser with a discharge opening through which the atomised spray is directed, and actuating means for operating the atomiser when it is mounted on the carrier.

In a particularly preferred embodiment slots are provided in a rear wall of the housing for reception of mounting screws to demountably secure the carrier on an upright support surface. Typically, the slots have an inverted keyhole shape.

The invention will be more clearly understood by the following description of some embodiments thereof, given by way of example only, with reference to the accompanying drawings, in which:-

Fig. 1 is a perspective view of an atomiser according to the invention;

Fig. 2 is an elevational, partially sectioned view of a pump portion of the atomiser;

Fig. 3 is a plan view of a filter portion of the atomiser;

Fig. 4 is a sectional elevational view taken along the line IV-IV of Fig. 3;

Fig. 5 is a detail sectional view of portion of the filter shown in Fig. 4;

Fig. 6 is a perspective view of an alternative type of filter for use with the atomiser;

Fig. 7 is an exploded elevational view of another filter assembly for the atomiser;

Fig. 8 is a plan view of portion of the filter of Fig. 7;

Fig. 9 is a plan view of another portion of the filter of Fig. 7;

Fig. 10 is a detail sectional elevational view of the filter of Fig. 7 shown mounted on an atomiser bottle;

Fig. 11 is a perspective view of a carrier for mounting the atomiser on a support surface;

Fig. 12 is a rear elevational view of the carrier;

Fig. 13 is a perspective view of another carrier for the atomiser;

Fig. 14 is a front elevational view of the carrier of Fig. 13;

Fig. 15 is a side elevational view of the carrier of Fig. 13;

Fig. 16 is a detail perspective view showing portion of the carrier of Fig. 13;

Fig. 17 is a side elevational view of the carrier portion shown in Fig. 16;

Fig. 18 is a perspective view of another carrier for the atomiser;

Fig. 19 is a front elevational view of the carrier with a front cover of the carrier removed;

Fig. 20 is a side sectional elevational view of the carrier portion of Fig. 19;

Fig. 21 is a perspective view of the carrier portion of Fig. 19;

Fig. 22 is a perspective view of another carrier; and

Fig. 23 is a perspective view of the carrier of Fig. 22 with a front cover removed.

Referring to the drawings, and initially to Figs. 1 to 5 thereof, there is illustrated a water atomiser indicated generally by the reference numeral 1. The water atomiser 1 has a clear plastics container 2. A pump 3 is mounted on the container 2 for dispensing water from the container 2 as an atomised spray. The pump 3 incorporates an air vent passage communicating between an interior and an exterior of the container 2 to allow air into the container 2 as water is discharged therefrom. Mounted on the pump 3 across the vent passage is a filter 4 to purify air drawn into the container 2 when water is discharged from the container 2.

The pump 3 has a cylindrical housing 9 of plastics material. A spring-loaded plunger 5 is slidably mounted within the housing 9 and projects outwardly from an upper end of the housing 9. A pump inlet 6 at a lower end of the housing 9 has a feed tube 7 attached thereto and extending downwardly to a bottom of the container 2. A fluid passage through the plunger 5 leads to a pump outlet 8. A nozzle 10 with a discharge opening 11 is mounted at the pump outlet 8 to produce a fine atomised water mist when the pump 3 is operated.

A mounting flange 14 projects outwardly of the housing 9. An outer edge 15 of the flange 14 is a snap-fit into engagement with a periphery of an opening at a top of the container 2 for mounting the pump 3 on the container 2. A vent passage passes through the housing 9 to vent air into the container 2 as the pump 3 is operated. The filter 4 is mounted between the housing 9 and the flange 14 across the vent passage to filter air vented into the container 2.

Referring now in particular to Figs. 3 to 5 the filter 4 is shown in more detail. The filter 4 comprises a plastics holder 20 having a tubular body 21 which is a sleeved fit on an exterior of the housing 9. An annular flange 22 is provided at an upper end of the body 21 and has an upstanding peripheral rim 23. A number of spaced-apart through holes 24 forming air vent holes are provided around the flange 22. These through holes 24 are covered by an annular membrane filter 26 having a pore size of 0.2 microns. It will be noted that an inwardly directed lip 27 is provided at a lower end of the body 21 to form an energy director for ultrasonic welding of the holder 20 to an exterior of the pump housing 9. Similarly an upper end of the rim 23 is provided with a pointed tip 28 forming an energy director for ultrasonic welding of the rim 23 to an underside of the flange 14 of the pump 3.

In use, the container 2 is filled with pure water. The pump 3 can be operated by depressing and releasing the plunger 5 as desired to discharge water in a fine atomised spray. Ambient air is drawn in through the vent passage as the pump 3 is operated and is filtered as it passes through the membrane filter 26 and into the container 2.

The filter pore size is such that it forms a barrier to

any bacteria thus ensuring the purity of the water within the container 2 is maintained during use. There is, however, sufficient air movement through the filter so that the spray remains effective and fine. A typical Gurley air flow for the filter is rated at 27.4 seconds/100 cc. The membrane is hydrophobic with a water breakthrough at 32 psi.

Referring now to Fig. 6 there is illustrated another filter holder 30. This is similar to the holder described previously with reference to Figs. 3 to 5 and like parts are assigned the same reference numerals. In this case through holes 31 for through passage of air are provided where the body 21 meets the flange 22.

Referring now to Figs. 7 to 10, an alternative filter assembly for the atomiser is shown and indicated generally by the reference numeral 35. The filter assembly 35 comprises an outer housing 36 and a complementary inner housing 37 engagable within the outer housing 36. The outer housing 36 has a tubular body 38 defining a bore 39 for reception of the inner housing 37 and through passage of the pump housing 9. A lower end 40 of the housing 38 has a stepped central through hole 41, an inner portion 42 of which receives an O-ring seal 43. An outwardly extending flange 44 at an upper end of the housing 38 has an upstanding peripheral rim 45. A number of spaced-apart through holes 46 are provided in the flange 44. A retaining ridge 47 is provided on an inner side wall of the rim 45 for retention of the inner housing 37 within the outer housing 36. The inner housing 37 has a tubular body 48 defining a bore 49 for reception of the pump housing 9. A flanged upper end 50 of the inner housing 37 has a number of through holes 51 associated with the holes 46 in the outer housing 36. The inner housing 37 is engagable within the outer housing 36 to securely engage an annular filter ring 52 between the flanges 44, 50 of the housings 36, 37. A bottom wall of the inner housing has a central through hole 53. Fig. 10 shows the filter assembly 35 mounted within a neck 54 of the container 2. It will be noted that an outer surface 55 of the rim 45 of the outer housing 36 sealingly engages an inner surface of the neck 54. The filter assembly 35 is a push fit into engagement with the neck 54 of the container 2. The pump 3 is mounted on the container 2 with the pump housing 9 passing downwardly through the inner housing 37 and projecting through the holes 41, 53 with an airtight seal being made with the pump housing 9 at the bottom of the housings 36, 37 by the O-ring seal 43. Vent air is thus obliged to pass through the filter ring 52 into the container 2.

Referring now to Figs. 11 and 12 there is illustrated a carrier 260 for a water atomiser of the type previously described. The carrier 260 has a housing 261 for reception of a water atomiser 1. When mounted within the housing 261 the discharge opening 11 of the nozzle 10 of the atomiser 1 aligns with an outlet opening 263 in a front wall of the housing 261. An operating button 264 mounted on a top of the housing 261 is operable to move the nozzle 10 and hence the pump plunger to dis-

charge a fine spray of water from the atomiser 1. Fig. 12 shows a rear wall 265 of the housing 261 which has a pair of spaced-apart inverted keyhole-shaped slots 266 for engagement with screw heads to demountably secure the housing 261 on a support surface such as a wall or the like.

It will be appreciated that the carrier 60 may also be used for other types of water atomiser in addition to the ones described herein.

Referring now to Figs. 13 to 17, there is shown another atomiser carrier device 120. The device 120 has a housing 121 within which an atomiser 1 is mounted. The atomiser 1 is mounted on a support 124 having a frame 125 for reception of an atomiser 1. The frame 125 is supported on a pivot link 126 having inclined pivot arms 127 at each side of the frame 125 lower ends of each pivot arm being pivotally mounted on the housing 121. An operating button 129 engages the frame 125 through link arms 130. A U-shaped guide 131 is provided within which the button 129 is slidable. Upon moving the button 129 inwardly in the direction of arrow X (Fig. 17) the arms 127, 130 move the frame 125 upwardly to engage the nozzle head 10 against a stop 135 thus delivering an atomised spray of water on demand from the device 120. A return spring 136 connects between a lower end of the frame 125 and the housing to return the frame 125 to the lowered position when the button 129 is released.

Referring to Figs. 18 to 21, another dispenser device 140 is shown. The device 140 has a housing 141 within which is mounted a bottle holder 142. As can be seen in Fig. 19, the atomiser 1 is housed within the bottle holder 142 with the nozzle portion 10 resting against a stop 143 at a top of the bottle holder 142. A bottle raising cam 145 is pivotally mounted on a base 146 of the bottle holder 142 by means of a pivot pin 147. Downwardly depending flanges 149 at a bottom of the bottle holder 142 slidably receive an operating button 150 for actuation of the cam 145. Slots 151 on the button 150 slidably engage the flanges 149. Upon depressing the button 150, the cam 145 pivots to raise the bottle within the bottle holder 142 thus operating the nozzle 10 to discharge a fine atomised mist of water.

Referring now to Figs. 22 and 23, there is illustrated another carrier 180 comprising a housing 181 within which an atomiser 1 is mounted. The nozzle 10 of the atomiser 1 is aligned with an outlet hole 183 on the housing 181. An operating button 184 is operable to pivot an actuating cam 186 by means of a drive motor acting through a gear train 187 to operate the nozzle 10 for discharge of an atomised spray of water from the atomiser 1.

The invention is not limited to the embodiments hereinbefore described which may be varied in both construction and detail.

Claims

1. A carrier for a pump type atomiser of the type com-

prising a container with a pump for dispensing a liquid from the container through a discharge nozzle at a top of the container, the carrier comprising means for reception of the atomiser, means for mounting the carrier on a support surface and means for actuating the pump to discharge liquid from the atomiser.

2. A carrier as claimed in claim 1 wherein the carrier comprises a support having means for mounting the container in an upright position and the actuating means is operable to engage and lift the container on the support to engage the nozzle with an associated stop on the support for operation of the pump.
3. A carrier as claimed in claim 1 or 2 wherein the actuating means is a cam.
4. A carrier as claimed in claim 3 wherein the carrier comprises a housing within which is mounted a holder for reception of the atomiser with the nozzle of the atomiser resting against a stop at a top of the holder, a container raising cam pivotally mounted on a base of the holder, downwardly depending flanges at a bottom of the holder slidably receiving an operating button for actuation of the cam.
5. A carrier as claimed in claim 2 wherein the carrier comprises a housing, a support within the housing for the atomiser, the support having a frame for reception of the atomiser, the frame being supported on a pivot link having inclined pivot arms at each side of the frame, lower ends of each pivot arm being pivotally mounted on the housing, an operating button engaging the frame through the link arms, the operating button slidably movable in a guide for movement of the frame upwardly to engage the nozzle of an atomiser mounted in the frame against a stop to operate the pump of the atomiser.

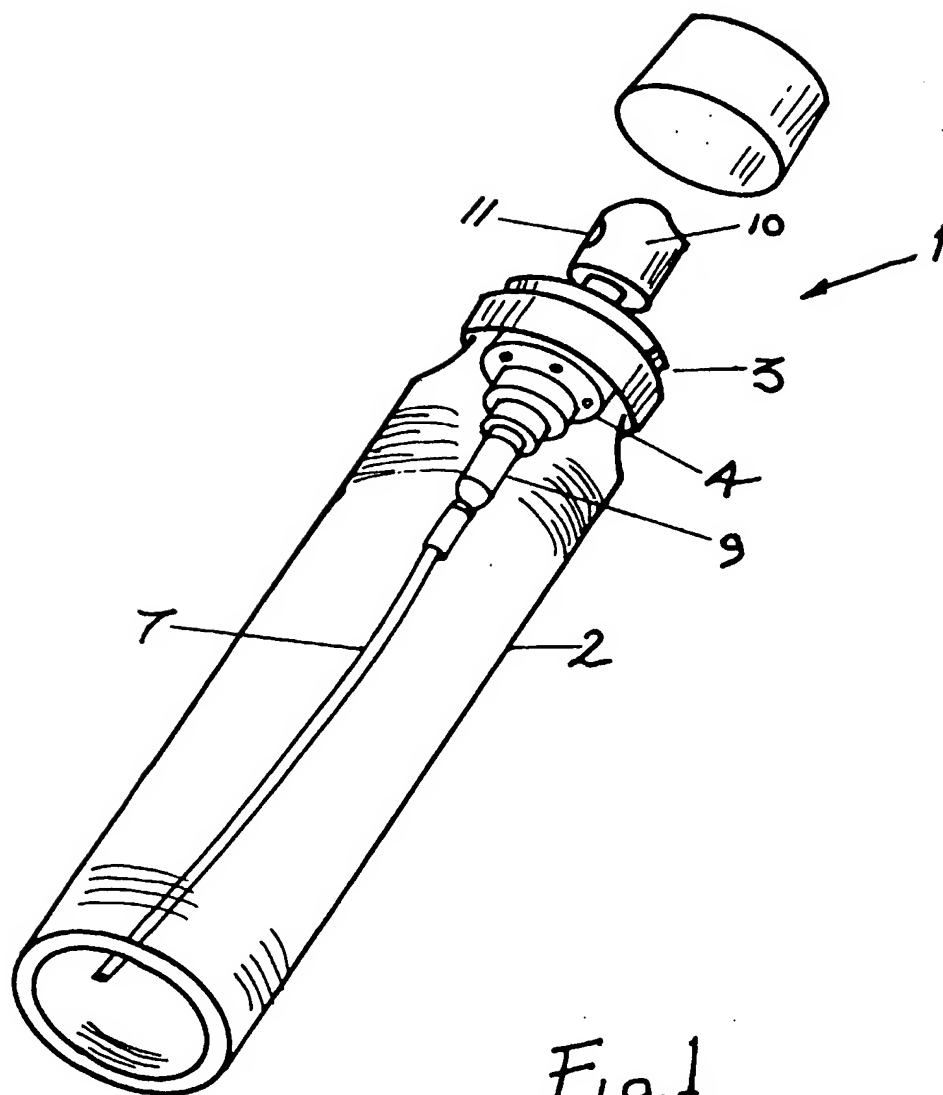
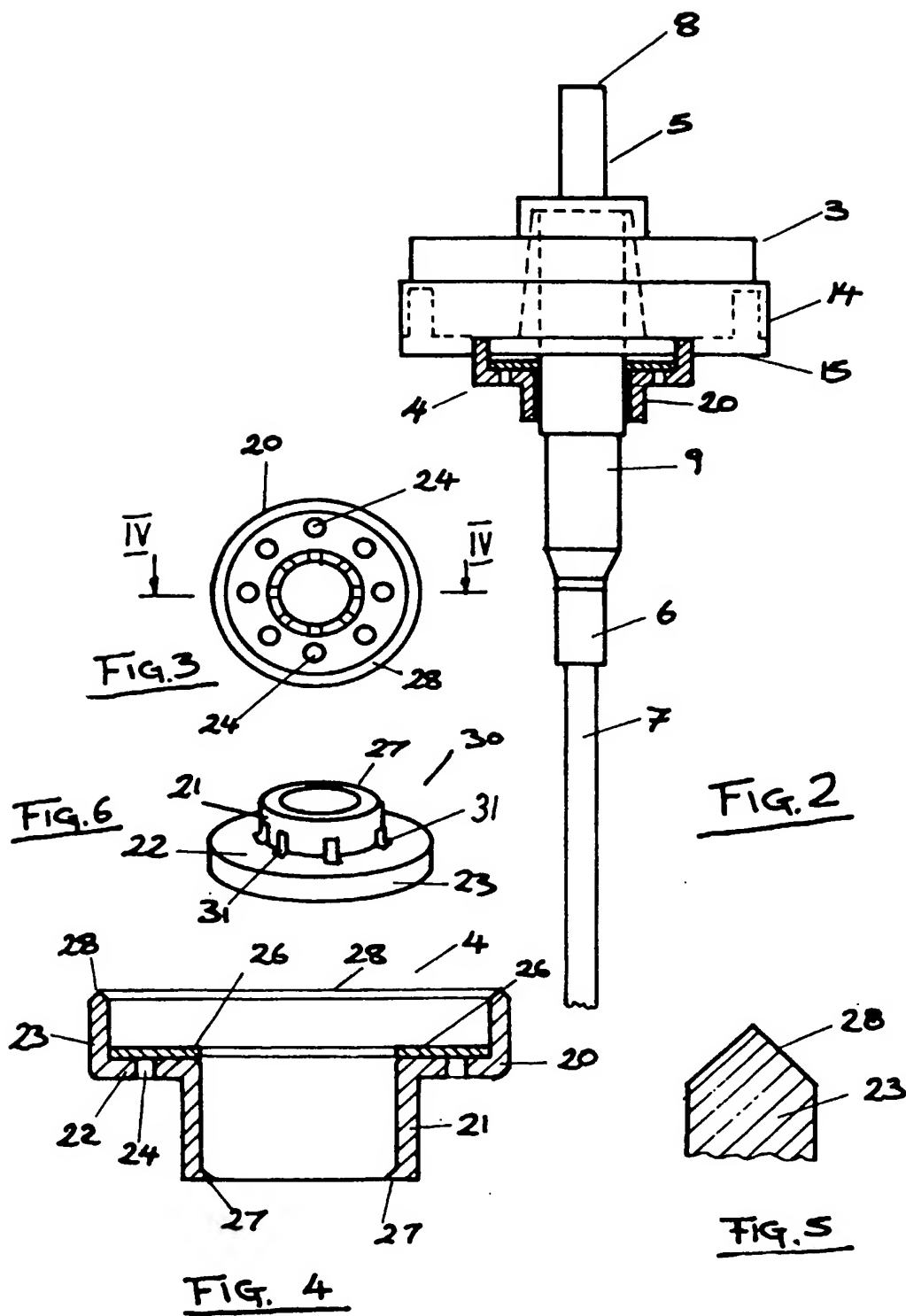
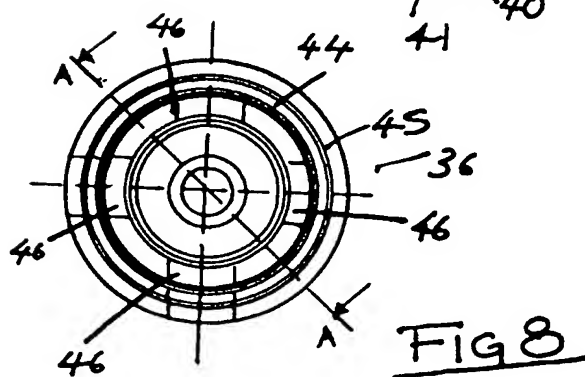
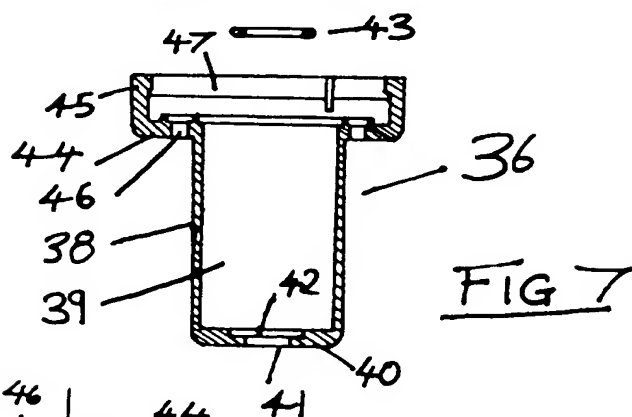
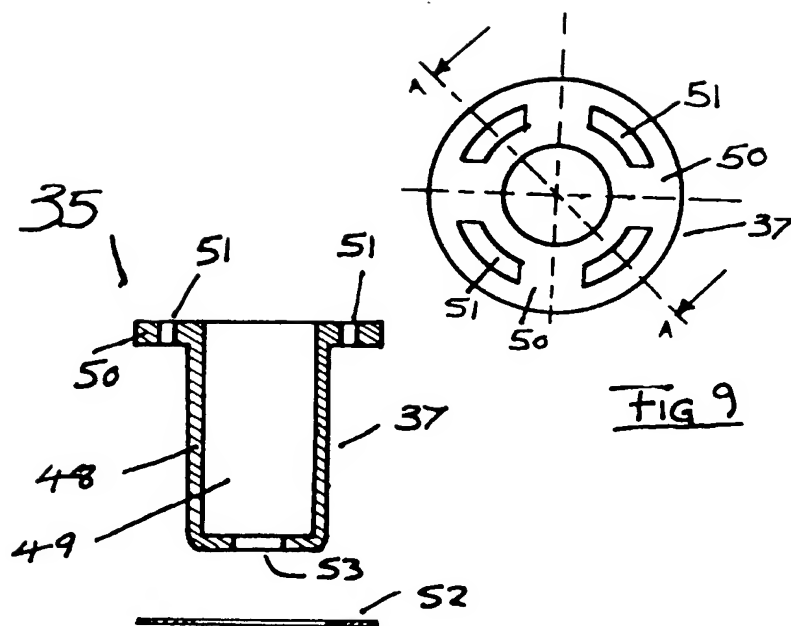


Fig. 1





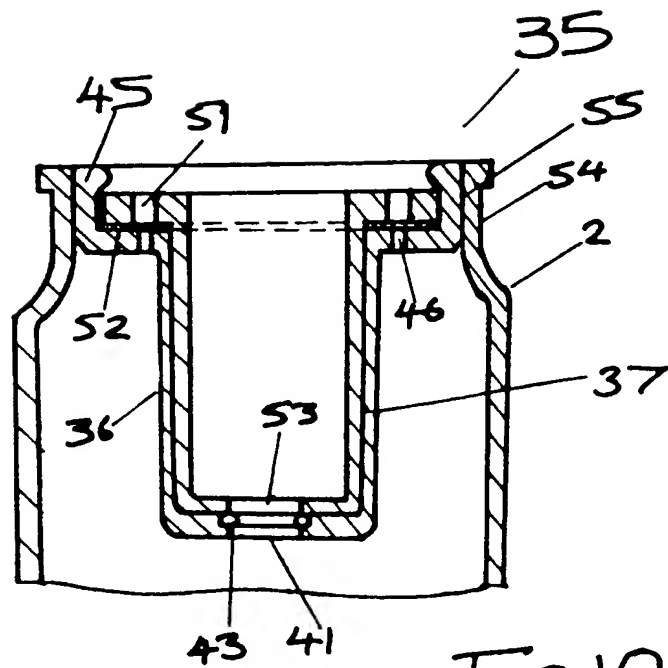
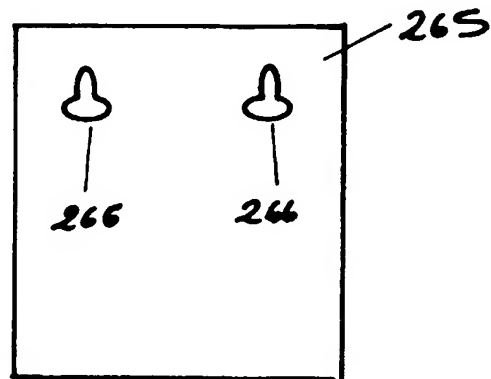
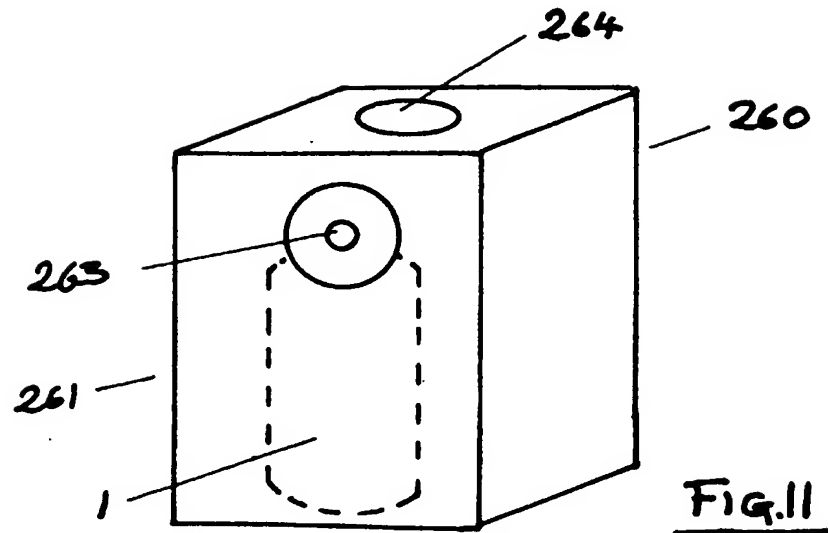
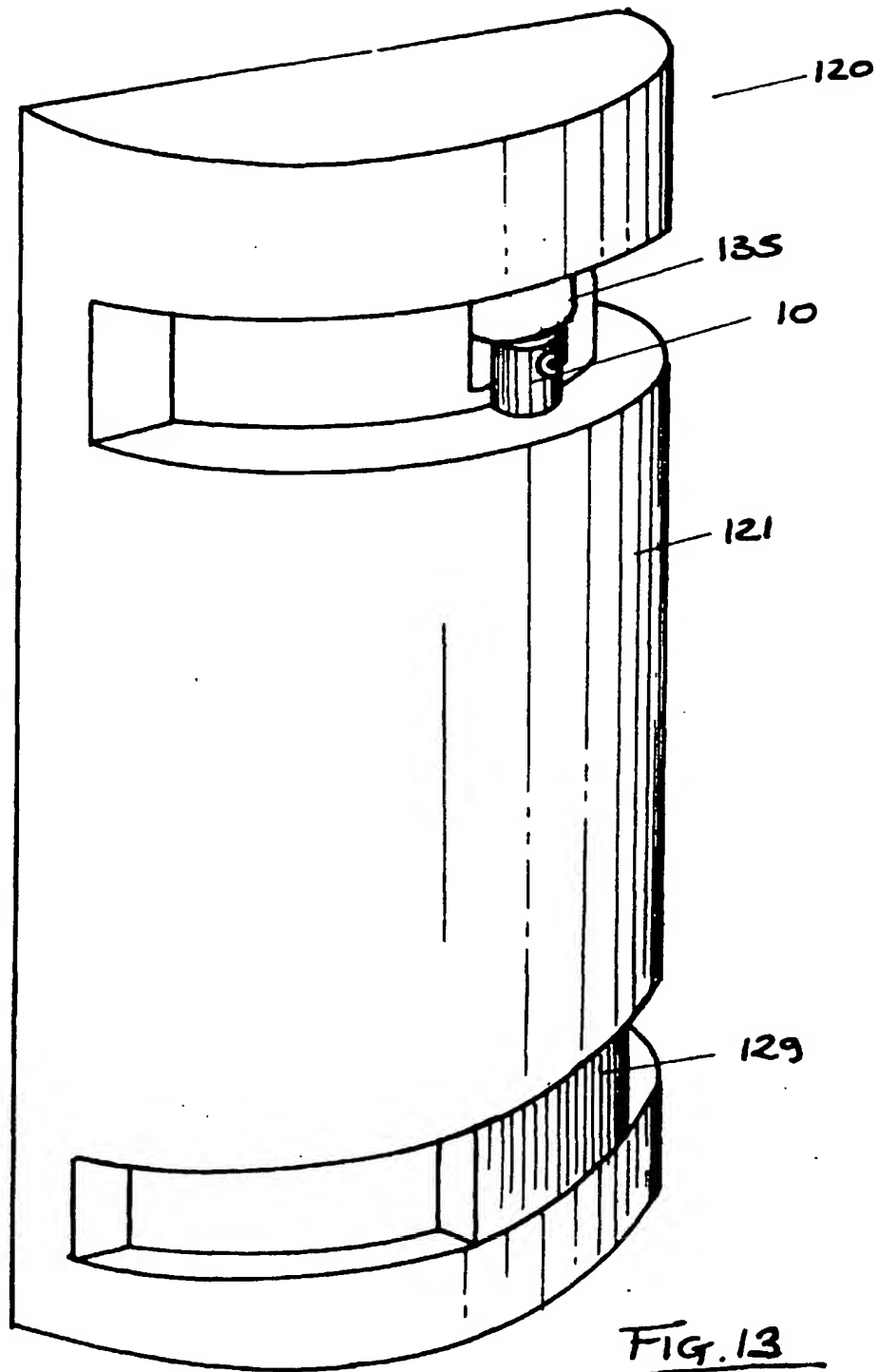


FIG.10





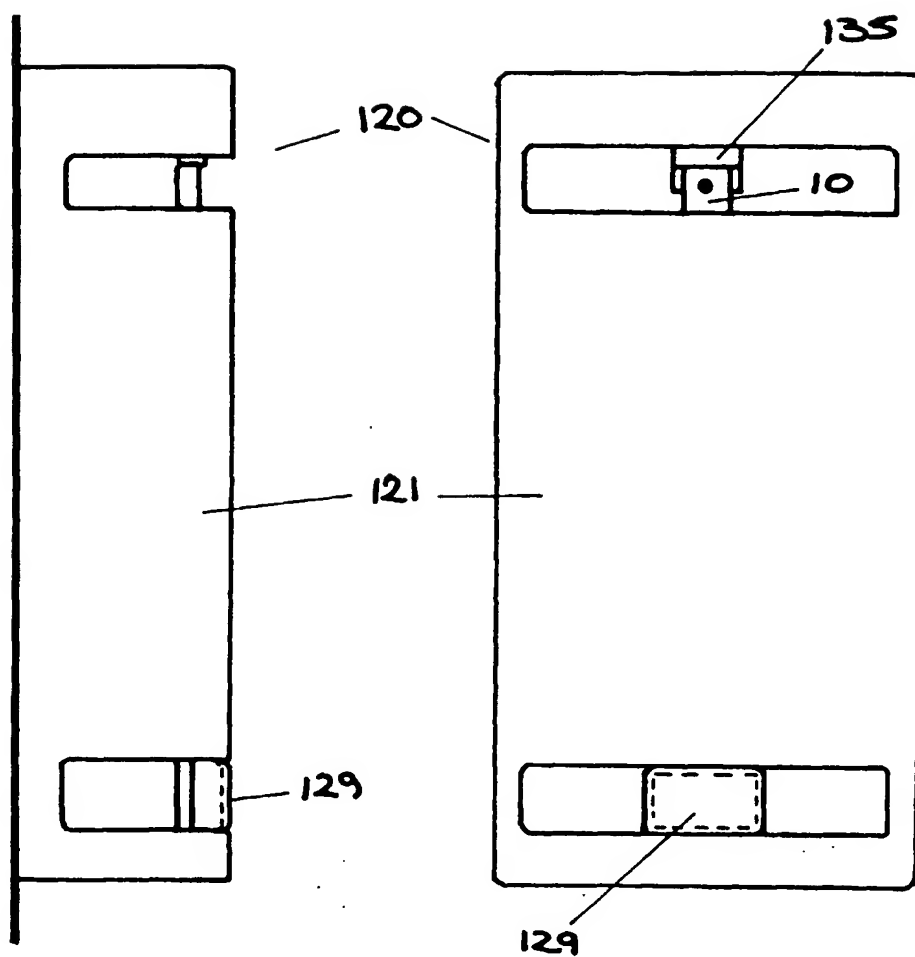


FIG. 15

FIG. 14

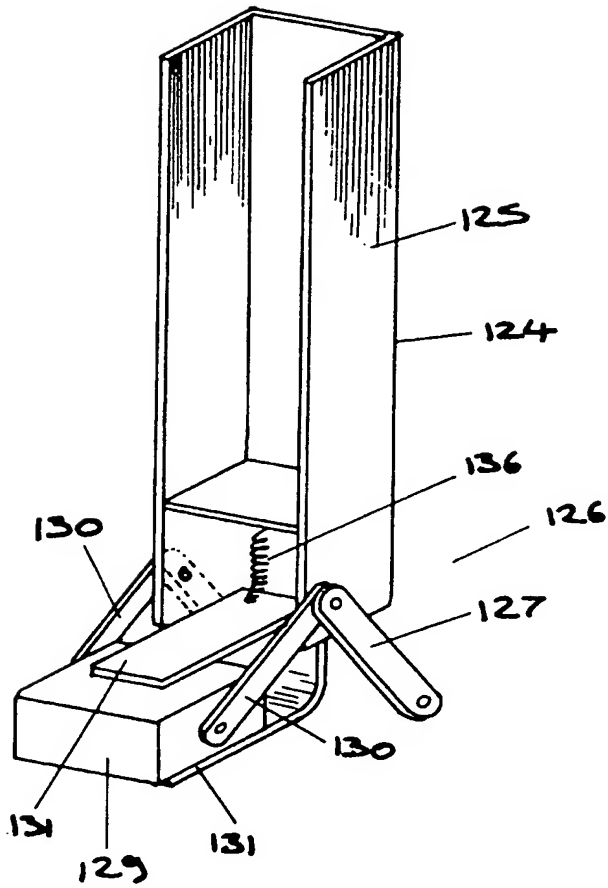


FIG. 16

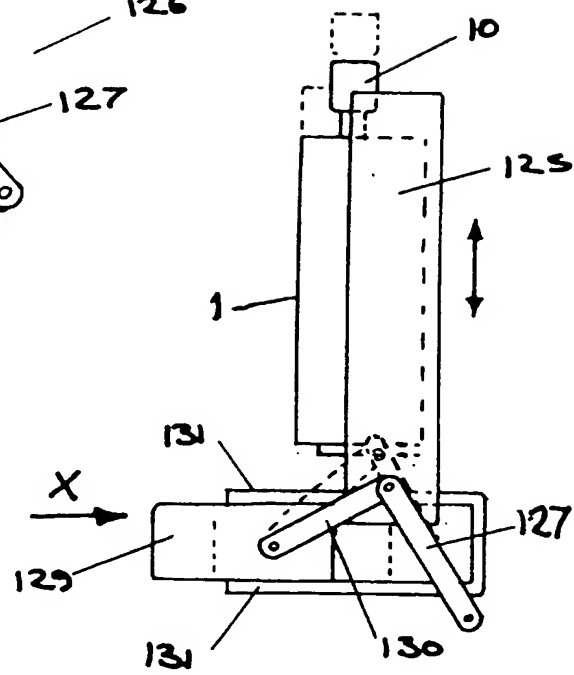


FIG. 17

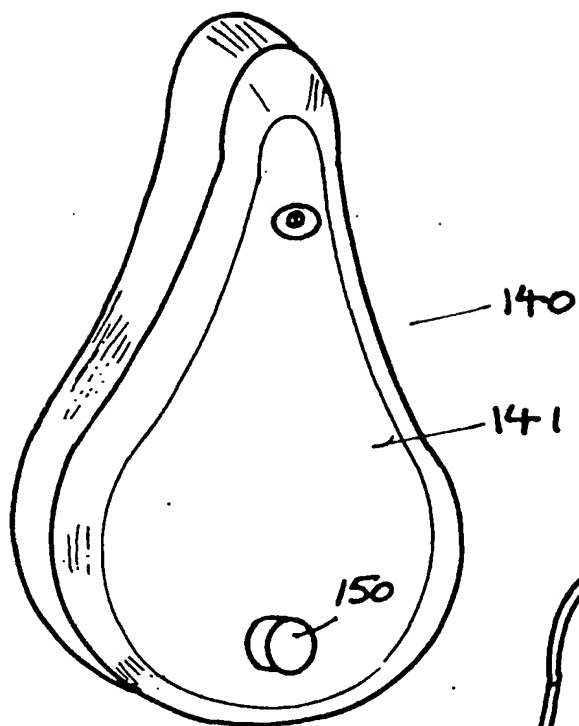


FIG. 18

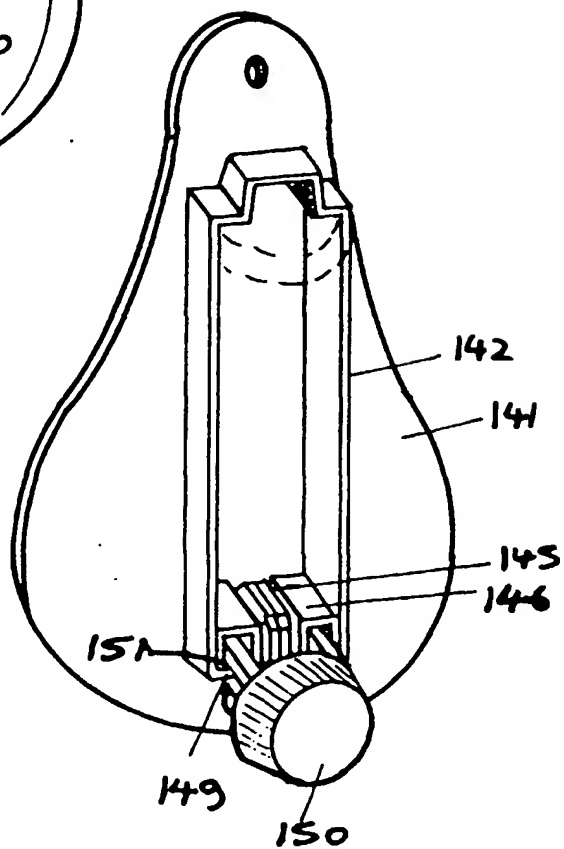


FIG. 21

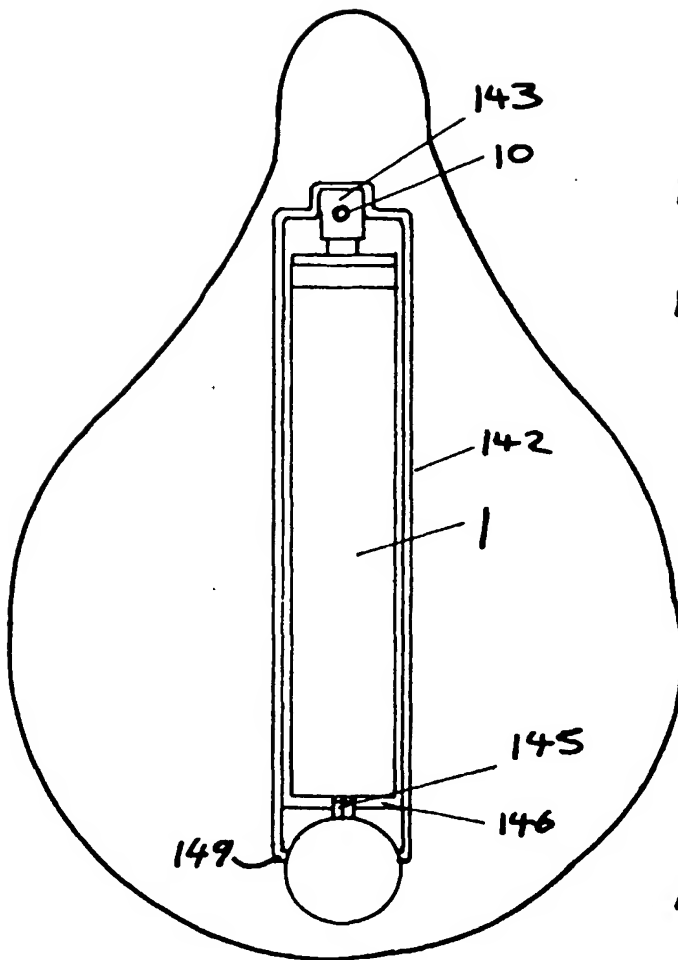


FIG. 19

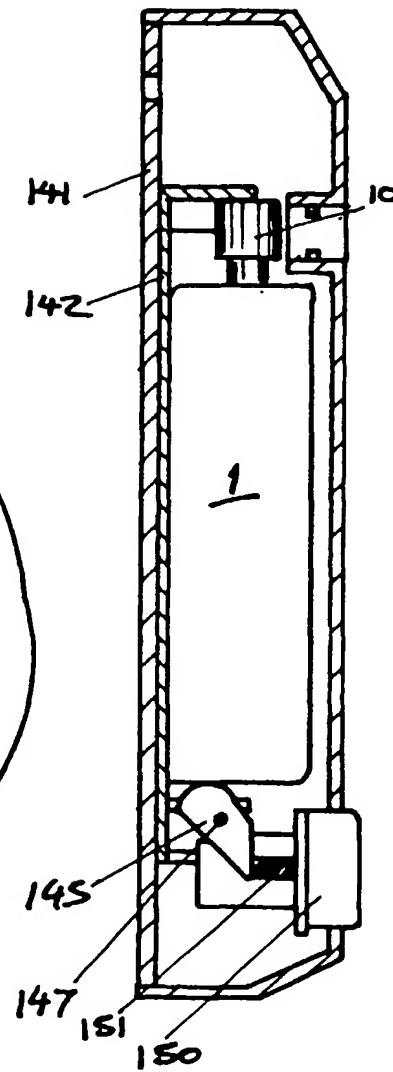


FIG. 20

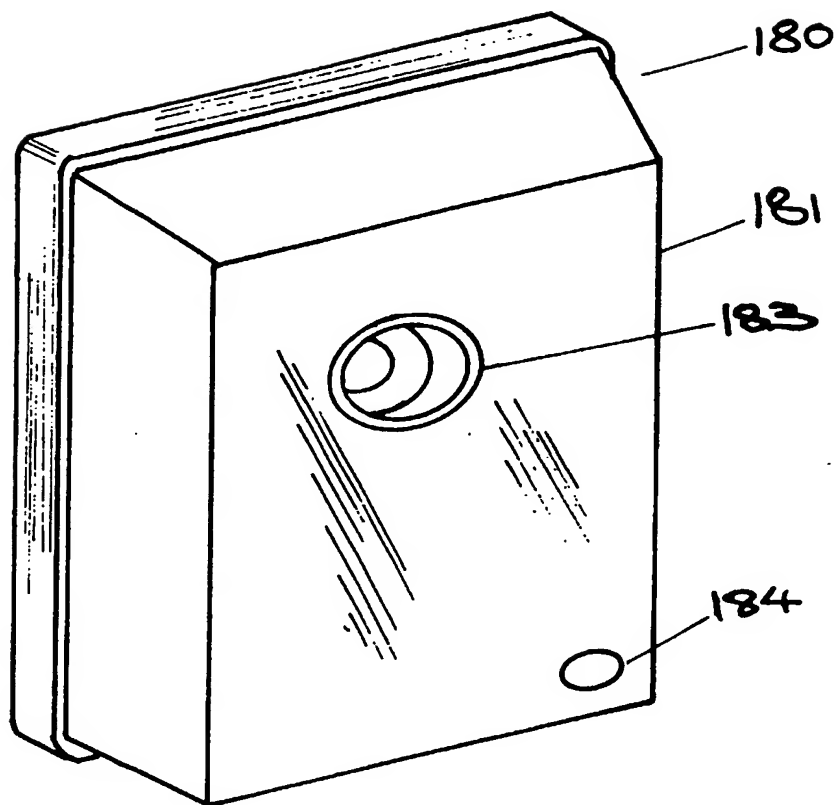


FIG.22

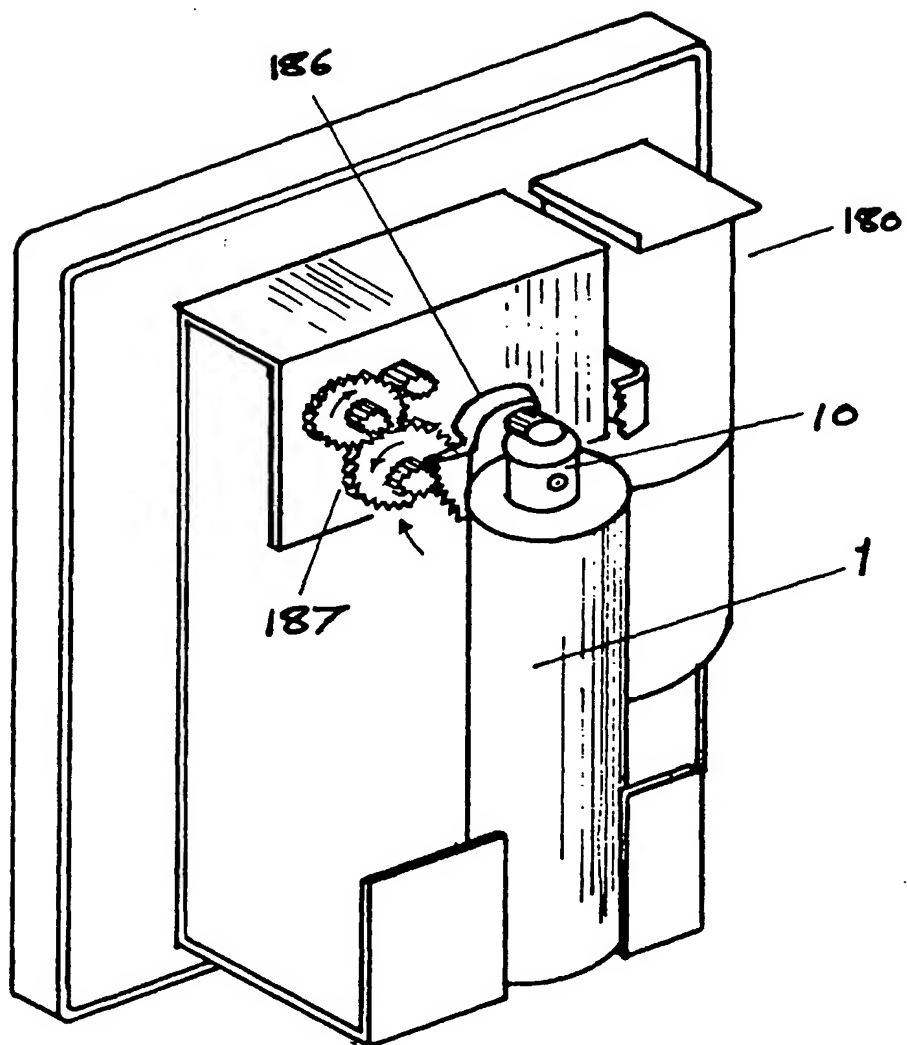


FIG 23